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CLAIMS

[Claim(s)]

[Claim 1] The fiber optic cable for air feeding which is a fiber optic cable inserted and laid into a laying duct by the air feeding method, and is characterized by forming two or more heights in the die-length direction spirally, and growing into the outermost enveloping layer of this fiber optic cable.

[Claim 2] A height is a fiber optic cable for air feeding according to claim 1 characterized by arranging and growing into the circumferencial direction of said fiber optic cable at equal intervals.

[Claim 3] A height is claim 1 characterized by for the include angle of one side face having 90 or less dip, and changing to the tangent of said fiber optic cable, and a fiber optic cable for air feeding given in two.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the fiber optic cable for air feeding inserted and laid into a laying duct by the air feeding method.

[0002]

[Description of the Prior Art] Hereafter, the conventional technique is explained based on a drawing.

[0003] The air feeding method is one of the laying methods of construction of the fiber optic cable that a fiber optic cable receives air resistance with the feeding air passed in a laying duct, the fiber optic cable itself is conveyed with the thrust generated as a result, and it can lay in a duct, first. About laying, the frictional resistance of a fiber optic cable and a laying duct is small, and a fiber optic cable with the larger air resistance over feeding air has a better feeding property (namely, conveying distance of the fiber optic cable to the pressure and flow rate of feeding air).

[0004] Drawing 3 is the cross-sectional view of the spacer mold fiber optic cable widely used by the air feeding method. For a fiber optic cable and 12, as for an optical fiber and 14, the outermost enveloping layer and 13 are [11 / a spacer and 15] tension members. Generally this fiber optic cable 11 is widely used by optical communication, an optical fiber 13 is stored in the slot established in the spacer 14, and the outermost enveloping layer 12 is covered outside.

[0005] There is a tension member 15 at the core of a spacer 14, and the tensile strength of a fiber optic cable 11 is maintained. In addition, by the air feeding method, things, such as a tape slot mold fiber optic cable, a ***** type fiber optic cable, and a unit mold fiber optic cable, are also used.

[0006] Drawing 4 is the cross-sectional view of the fiber optic cable for air feeding currently indicated by JP,6-300946,A. For a fiber optic cable and 22, as for a height and 24, the outermost enveloping layer and 23 are [21 / an optical fiber and 25] secondary coating layers. Two or more twisted optical fibers 24 are covered with the secondary coating layer 25, and the outermost enveloping layer 22 is covered from on the.

[0007] Two or more heights 23 are formed in the outermost enveloping layer 22. By forming this height 23, surface area of the fiber optic cable 21 in contact with a laying duct is made small, as a result, the frictional resistance between a laying duct and a fiber optic cable 21 becomes small, and a feeding property improves.

[0008] In addition, the resin constituent which added the ultra high molecular weight polyethylene whose molecular weight is 1 million or more is used for polyethylene by the ingredient of the outermost enveloping layer 22 of a fiber optic cable 21.

[0009]

[Problem(s) to be Solved by the Invention] There were the following troubles in the conventional fiber optic cable for air feeding.

[0010] There was a problem that the fiber optic cable which made small frictional resistance between the fiber optic cable for general optical communication, and a laying duct and a fiber optic cable which were described above was not enough as the thrust which cannot enlarge the air resistance acquired from

feeding air, therefore is generated, and conveying distance was short.

[0011] In addition, in order to enlarge air resistance, when the amount and pressure of feeding air are increased, the utilization effectiveness of feeding air falls, and the problem that cost becomes high is also produced.

[0012] Therefore, the object of this invention is to offer the fiber optic cable for air feeding which canceled the fault of the above mentioned conventional technique, enlarged the air resistance acquired from feeding air, and raised the feeding property.

[0013]

[Means for Solving the Problem] This invention formed two or more heights in the die-length direction spirally at the outermost enveloping layer of a fiber optic cable in order to realize the above-mentioned object.

[0014] Moreover, the height has been arranged at equal intervals to the circumferencial direction of a fiber optic cable.

[0015] And the height was constituted so that the include angle of one side face might have 90 or less dip to the tangent of a fiber optic cable.

[0016]

[Embodiment of the Invention] Hereafter, the example of this invention is explained based on a drawing.

[0017] Drawing 1 is the cross-sectional view having shown one example of the fiber optic cable for air feeding of this invention. For the outermost enveloping layer and 3, as for an optical fiber and 5, a height and 4 are [1 / a fiber optic cable and 2 / a spacer and 6] tension members.

[0018] An optical fiber 4 is stored in the slot established in the spacer 5, and the outermost enveloping layer 2 is covered outside. A tension member 6 is formed in the core of a spacer 5, and the tensile strength of a fiber optic cable 1 is maintained.

[0019] A height 3 continues on a periphery and is prepared in the outermost enveloping layer 2 of a fiber optic cable 1 at equal intervals. Moreover, these heights 3 are constituted so that it may become spiral at the longitudinal direction of a fiber optic cable 1. Furthermore, the include angle theta of one side face of a height 3 and the tangent of a fiber optic cable 1 to accomplish is constituted so that it may become 90 or less degrees.

[0020] Therefore, the thrust to which air resistance can become large becomes large from the case where the both-sides side of a height has a bigger include angle than 90 degrees to the tangent of a fiber optic cable, like the conventional fiber optic cable for air feeding shown by drawing 4. Moreover, the area which receives feeding air increases compared with what prepared irregularly the thing which prepared the height at a level with the die-length direction of a fiber optic cable, and two or more heights in the fiber optic cable front face, and big air resistance can be acquired.

[0021] Furthermore, since the height 3 is arranged at equal intervals, the air resistance to generate becomes homogeneity to a fiber optic cable 1, and the phenomenon in which air resistance inclines only toward an one direction and bars conveyance of a fiber optic cable 1 can be made for there to be nothing. That is, the thrust obtained is efficiently utilizable for conveyance of a fiber optic cable 1.

[0022] Drawing 2 is the explanatory view showing the situation in the duct of the fiber optic cable of drawing 1. 7 is a duct. By the height 3 prepared in the fiber optic cable 1, it has responded to efficiently the feeding air which flows the perimeter of a fiber optic cable 1. Consequently, the air resistance to generate became large, the bigger thrust was obtained, and conveying distance was able to be lengthened.

[0023] In addition, in the one example of this invention, although the fiber optic cable showed the spacer mold fiber optic cable, if the same height as an example is formed in the outermost enveloping layer, it can improve a feeding property also in common fiber optic cables, such as a tape slot mold fiber optic cable, a layer twist mold fiber optic cable, and a unit mold fiber optic cable.

[0024]

[Effect of the Invention] Since two or more heights are arranged at equal intervals to the outermost enveloping layer at the circumferencial direction, and it formed in the die-length direction spirally in the

fiber optic cable for air feeding of this invention, the include angle θ of a height side face and the tangent of a fiber optic cable to accomplish was further made into 90 or less degrees and the thrust which enlarges air resistance with feeding air and is generated was enlarged, it became possible to improve a feeding property.

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TECHNICAL FIELD

[Field of the Invention] This invention relates to the fiber optic cable for air feeding inserted and laid into a laying duct by the air feeding method.

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PRIOR ART

[Description of the Prior Art] Hereafter, the conventional technique is explained based on a drawing. [0003] The air feeding method is one of the laying methods of construction of the fiber optic cable that a fiber optic cable receives air resistance with the feeding air passed in a laying duct, the fiber optic cable itself is conveyed with the thrust generated as a result, and it can lay in a duct, first. About laying, the frictional resistance of a fiber optic cable and a laying duct is small, and a fiber optic cable with the larger air resistance over feeding air has a better feeding property (namely, conveying distance of the fiber optic cable to the pressure and flow rate of feeding air).

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[0008] In addition, the resin constituent which added the ultra high molecular weight polyethylene whose molecular weight is 1 million or more is used for polyethylene by the ingredient of the outermost enveloping layer 22 of a fiber optic cable 21.

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EFFECT OF THE INVENTION

[Effect of the Invention] Since two or more heights are arranged at equal intervals to the outermost enveloping layer at the circumferencial direction, and it formed in the die-length direction spirally in the fiber optic cable for air feeding of this invention, the include angle theta of a height side face and the tangent of a fiber optic cable to accomplish was further made into 90 or less degrees and the thrust which enlarges air resistance with feeding air and is generated was enlarged, it became possible to improve a feeding property.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] There were the following troubles in the conventional fiber optic cable for air feeding.

[0010] There was a problem that the fiber optic cable which made small frictional resistance between the fiber optic cable for general optical communication, and a laying duct and a fiber optic cable which were described above was not enough as the thrust which cannot enlarge the air resistance acquired from feeding air, therefore is generated, and conveying distance was short.

[0011] In addition, in order to enlarge air resistance, when the amount and pressure of feeding air are increased, the utilization effectiveness of feeding air falls, and the problem that cost becomes high is also produced.

[0012] Therefore, the object of this invention is to offer the fiber optic cable for air feeding which canceled the fault of the above mentioned conventional technique, enlarged the air resistance acquired from feeding air, and raised the feeding property.

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MEANS

[Means for Solving the Problem] This invention formed two or more heights in the die-length direction spirally at the outermost enveloping layer of a fiber optic cable in order to realize the above-mentioned object.

[0014] Moreover, the height has been arranged at equal intervals to the circumferencial direction of a fiber optic cable.

[0015] And the height was constituted so that the include angle of one side face might have 90 or less dip to the tangent of a fiber optic cable.

[0016]

[Embodiment of the Invention] Hereafter, the example of this invention is explained based on a drawing.

[0017] Drawing 1 is the cross-sectional view having shown one example of the fiber optic cable for air feeding of this invention. For the outermost enveloping layer and 3, as for an optical fiber and 5, a height and 4 are [1 / a fiber optic cable and 2 / a spacer and 6] tension members.

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[0021] Furthermore, since the height 3 is arranged at equal intervals, the air resistance to generate becomes homogeneity to a fiber optic cable 1, and the phenomenon in which air resistance inclines only toward an one direction and bars conveyance of a fiber optic cable 1 can be made for there to be nothing. That is, the thrust obtained is efficiently utilizable for conveyance of a fiber optic cable 1.

[0022] Drawing 2 is the explanatory view showing the situation in the duct of the fiber optic cable of drawing 1. 7 is a duct. By the height 3 prepared in the fiber optic cable 1, it has responded to efficiently the feeding air which flows the perimeter of a fiber optic cable 1. Consequently, the air resistance to generate became large, the bigger thrust was obtained, and conveying distance was able to be lengthened.

[0023] In addition, in the one example of this invention, although the fiber optic cable showed the spacer mold fiber optic cable, if the same height as an example is formed in the outermost enveloping layer, it

can improve a feeding property also in common fiber optic cables, such as a tape slot mold fiber optic cable, a layer twist mold fiber optic cable, and a unit mold fiber optic cable.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the cross-sectional view showing one example of the fiber optic cable for air feeding of this invention.

[Drawing 2] It is the explanatory view showing the situation in the duct of the fiber optic cable for air feeding of drawing 1.

[Drawing 3] Conventionally, it is the cross-sectional view of the spacer mold fiber optic cable widely used by the air feeding method.

[Drawing 4] It is the cross-sectional view of the fiber optic cable for air feeding currently indicated by JP,6-300946,A.

[Description of Notations]

1, 11, 21 Fiber optic cable

2, 12, 22 The outermost enveloping layer

3 23 Height

4, 13, 24 Optical fiber

5 14 Spacer

6 15 Tension member

7 Duct

25 Secondary Coating Layer

theta Include angle of a height side face and the tangent of a fiber optic cable to accomplish

[Translation done.]

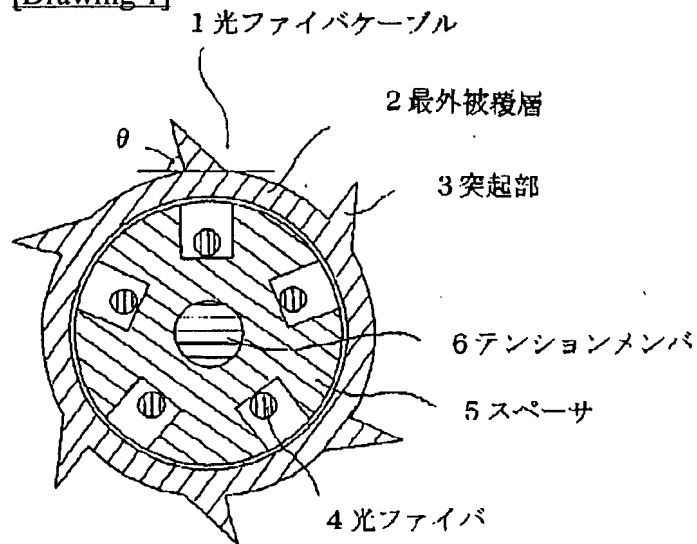
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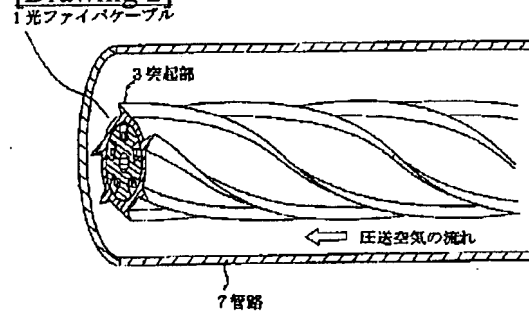
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DRAWINGS

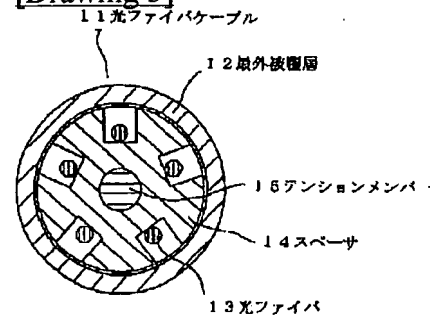
[Drawing 1]



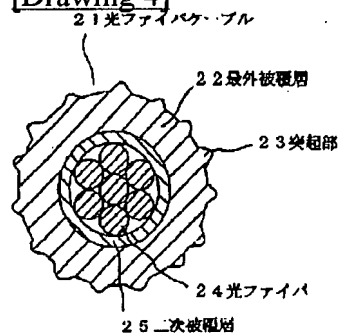
[Drawing 2]



[Drawing 3]



[Drawing 4]



[Translation done.]